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AUTHOR	Johnson, Kristy K.; And Others
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ABSTRACT

Compared with other fields of study, engineering at the higher education level has the lowest proportion of women students. A review of the literature concerning models of retention and female identity formation indicates that increased mentorship, curriculum revision, enrichment programs, and career workshops have been tried in efforts to increase integration of women engineering students into their professional communities. The University of Maryland at College Park used focus groups to evaluate programs designed to retain women in engineering. Meeting other women to share experiences and express opinions in a supportive atmosphere was cited by participants as a highly beneficial result of the group sessions. In addition, administrators, staff, and faculty can use such information to design effective and supportive programs for women in engineering and to cultivate connections and support among engineering students. It was hoped that the resulting sense of community and positive interactions with faculty and administrators within engineering schools will help to increase retention of women students. (Contains 16 references.) (MAH)

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Kristy K. Johnson, Julie L. Goldberg, and William E. Sedlacek

Research Report #14-95

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Summary

The purpose of this article is to describe the use of focus groups as a method of evaluating programs designed to retain women in engineering at the University of Maryland, College Park. The programs were funded by the Alfred P. Sloan Foundation and ECSEL (Engineering Coalition of Schools for Excellence in Education and Leaderships) within the A. James Clark School of Engineering. It was determined that having a conversation with the undergraduate female engineering students, directly, was the most effective way in creating rich data that provides a perspective for understanding what it means to be a female engineering student. Furthermore, the focus group model extends beyond the research goals by fostering community among female engineering students.

Overall, the results of the focus group process proved to be highly beneficial for the female participants. Being able to give feedback regarding their experience as a research fellow and a women in engineering was very important. Meeting the other women, talking about experiences, sharing the same stress and challenges, being able to hear what other females feel through expressing their own opinions in a supportive atmosphere, were all comments given regarding the focus group process. Such information allows administrators, staff, and faculty to devise the most effective and supportive programs for women in engineering as well as cultivate connections and feelings of support among student within the engineering environment,. Both outcomes of the focus group method contribute to increased retention.

Introduction

Michel (1987) states that in most countries there is only a small percentage of women in engineering and technological occupations. In fact, engineering at the higher education level, has the lowest proportion of women students compared with other fields of study. "Female students withdraw from engineering courses before graduation in greater numbers than from other courses of study" (p. 71). As professionals working towards the retention of women in engineering, we are compelled to ask, why are our female students leaving engineering?

Barber (1995) cites a number of studies that discuss the legislation created to dismantle sex discrimination (the Civil Rights Act and Title IX). The studies revealed that these legislative efforts did not produce the hoped for equal-opportunity classroom (Hall & Sandler, 1982; Sadker & Sadker, 1994; Wellesley College Center for Research on Women, 1993). Efforts in the areas of increased mentorship, curriculum revision, enrichment programs, and career workshops have been created to address the "chilly climate" for women. Although there has been some improvement in female retention in the last thirty years, Barber (1995) raised the question of whether it is due to the increased interest in engineering by women or merely a reflection of the overall increase of women entering higher education.

Barber (1995) indicates that there is no question that the number of women in science and engineering has increased over the last three decades. "In 1960 women received 19,362 bachelor's degrees and 381 doctorates in these disciplines; by 1990 the numbers had risen to 123,793 bachelor's degrees and 6,274 doctorates" (p.216). To what extent are these increases

due to changes specific to science, and to what extent do they reflect demographic or general social shifts? Barber (1995) addresses this question by looking at the number of bachelor's degrees awarded in all disciplines between 1960 and 1990. "Comparison of the numbers of women and men shows that throughout this period women were swelling the ranks of college students in all disciplines, not just science and engineering" (p.219). Although it is shown that women students are increasing in numbers throughout this period, female engineering and science students are not increasing at the same rate as women in other disciplines.

Women are changing their minds about science and engineering during their course-work. Barber (1995) suggests that women who choose to leave are choosing instead careers that allow them to preserve their identities. The cultural environment within these traditional male arenas is often one in which women do not feel comfortable. If the culture of science and engineering was transformed and broadened to be more inclusive of women and minorities, a more diverse, comfortable environment would be created, allowing further progress toward equity. Part of the process of cultural transformation is support. If women learn to strongly support one another, they will find ways to free themselves of existing constraints. Feeling supported is important for students to meet the challenges necessary towards graduation.

Models of Student Retention

In developing programs to retain women in engineering it is helpful to draw from and be guided by theorists in the area of student retention. As a theoretical foundation for student retention, Astin (1985) contends that students "learn by becoming involved" (Pascarella &

Terenzini, 1991, p. 50). The principles of the theory are based on the notion that involvement is achieved when students invest both psychological and physical energy into their tasks and activities. The amount of learning or development that occurs within these tasks is "directly proportional to the quality and quantity of involvement" (Pascarella & Terenzini, 1991, p. 50). Finally, the educational policies, services, and programs can directly foster or hinder students involvement. Astin's insights provide further understanding as to why female students leave engineering. If students do not feel connected and involved within their environment, it is likely that they will not be retained.

In turning to more explicit models, Tinto (1987) focused on the concept of integration. Depending on how integrated the students feel in their community will determine how likely the students persist through the program. Pascarella & Terenzini (1991) define "integration" as the "extent to which the individual shares the normative attitudes and values of peers and faculty in the institution and abides by the formal and informal structural requirements for membership in that community or in the subgroups of which the individual is a part" (p.53). Tinto contends that the level of integration is fostered by positive and gratifying experiences within the community. If encounters with the university, the informal and formal academic and social systems, are positive, students will become more integrated within those systems, thus leading to student retention. If those encounters are negative, integration is reduced, thus distancing the individual from academic and social communities of the institution. Therefore, negative encounters lead to marginalization which will ultimately result in student withdrawal. Hence, women engineering students need to experience a level of integration in their communities (classroom, engineering

societies, labs, study groups) as well as have positive interactions with faculty and administrators within the school of engineering.

Sedlacek (1993) reinforced the concepts of integration and involvement through the acknowledgment that nontraditional students need availability of a strong support person as well as opportunities for involvement within a community. As defined by Sedlacek (1991) "Nontraditional students include women, cultural/racial minorities, international students, older students, and so on. Thus, nontraditional students are those other than white, upper-middle class males, the group for whom most of our higher education system has been designed" (p. 75). Nontraditional students can be more effectively supported and retained when considering all variables that affect students lives, including noncognitive variables. Sedlacek (1993) described noncognitive variables as the following: "Positive Self-Concept or Confidence; Realistic Self-Appraisal; Understanding and Deals with Racism; Prefers Long-Range Goals to Short-Term or immediate needs; An Availability of Strong Support Person; Successful Leadership Experience; Demonstrated community Service; and Knowledge Acquired in a Field" (p.34). All of these variables are important for the retention of nontraditional students. Availability of a Strong Support Person is extremely important for women in traditionally male-dominated careers. Receiving support from one or more specific individuals will provide encouragement and resources for female students in engineering. Another variable that is particularly important for female students in engineering is Demonstrated Community Service. Women value long-term relationships in a community and in having the opportunity to contribute actively within their community. The consideration of noncognitive variables provides a means to more effectively address the needs of women within engineering.

Female Identity Development

The emerging literature on women's development has offered a new understanding of the centrality of connection in college women's development (Gilligan, 1982; Jordan, Kaplan, Miller, Stiver, & Surrey, 1991; Miller, 1986). Cook (1993) in discussing Miller's (1986) notions of women's development states "Women experience a sense of empowerment or 'zest' that derives from relational connection and provides energy to act in the world" (Cook, 1993, p. 17).

In Carol Gilligan's (1982) book, In a Different Voice, she further supports Miller's ideas of the female relational connection. In conducting extensive interviews with men and women Gilligan discovered that women make moral decisions from the voice of connection and community.

> Male and female voices typically have spoken of the importance of different truths, the male voice speaks of the role of separation in development as it comes to define and empower the self, and the female voices speak of the ongoing process of attachment that creates and sustains the human community (Hotelling & Forrest, 1985, p. 64).

The work of Gilligan (1982) is further supported by the research conducted at the Stone Center for Developmental Studies at Wellesley College. From clinical work with women, Jordan et al., (1991) state, "...for women at all life stages, relational needs are primary and healthy, and dynamic relationships are the motivating force that propels psychological growth" (p.37). They

explain further that women's self-esteem and sense of self worth is directly related to the extent that empathy and mutual empowerment is developed within their relationships. Finally, self-in-relation theory defines the deepening capacity for relationship and relational competence as the basic goal for development. The theory presented here can serve to inform administrators, staff, and faculty of the importance of providing contexts for the development of relationships and community amongst the women students in engineering.

Focus Groups: The Method

The focus group, qualitative method has been used as an evaluation tool to further understand the female engineering experience for the programs funded under two major grants received by the School of Engineering at the University of Maryland, College Park. In 1994 The Alfred P. Sloan Foundation awarded Maryland a five year grant to implement a Women in Engineering Program. An over-riding goal of the program is to increase the recruitment and retention of women in engineering. The University of Maryland is also part of a coalition of schools funded under the grant ECSEL (Engineering Coalition of Schools for Excellence in Education and Leadership). One of the major goals of ECSEL is to attract and retain greater numbers of ethnic minority and women students to the field of engineering.

Focus groups were utilized as a means of evaluating the programs funded by the Sloan Foundation and ECSEL. Having a conversation with the women, directly, was determined to be the most effective way in creating rich data that provides a window of understanding into what it means to be a female engineering student. Bers (1989) most simply and concisely defined a

focus group to be "a small (6-12 member), relatively homogeneous group that meets with a trained moderator who facilitates a 90-120 minute discussion in a nonthreatening, relaxed environment about a selected topic. The goal of a focus group is to elicit participants' perceptions, feelings, attitudes, and ideas" (p. 261). Focus groups do not generate quantitative data, information, or numbers that can be projected to a larger population. Generally, focus groups are a self-contained means of collecting data. They can also be combined with other methods such as survey instruments or questionnaires, or used as a follow-up method to generate a more thorough understanding of the phenomenon under study.

Design and General Considerations:

Generally speaking, designing the focus group study requires careful thought and reflection. Objectives need to be set up and discussion guidelines formulated. The purpose needs to be established, and a plan should be developed to determine how long the sessions will last and how many sessions are necessary to accomplish the goals of the focus group. The time and location are important factors that will aid in creating a space for openness and comfort. The questions prepared should be open-ended, clear, and presented in a context. It is important to identify participants and consider the characteristics of the individuals targeted for the sessions in order to best meet their needs.

The facilitator or moderator of the focus group needs to determine a level of involvement with the process. Depending on the group make-up and conditions of the environment, the moderator may need to be directive or nondirective. Kaase and Harshbarger (1993) provide an example of an effective moderator approach:

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> A successful group moderator will set the session's tone, encourage participation, probe people's feelings, attitudes, or behavior, and be a good listener. The moderator should guide participants through the discussion being careful to summarize group consensus. Additionally, the moderator should not show any bias through approving or disapproving body language or comments. Typically, a counselor or similarly trained person on a college campus serves this role well. Since the point of the focus group is to obtain perceptions, feelings, attitudes, and ideas, the moderator should ask open-ended and discussion-provoking questions (p. 286).

As already mentioned, it is important to consider the environment in which the focus group is conducted. This includes the seating and the establishment of comfort in order to create a strong level of intimacy among the participants and the moderator. Confidentiality needs to be stressed, especially when the sessions are tape recorded. Tape recording is recommended in order to obtain all of the nuances of the discussion, and also so that transcripts can be made and analyzed later. It is also important for the moderator to be nonevaluative and nonthreatening during the session in order for the participants to feel comfortable to share their thoughts and feelings.

Focus Group: A Link To Retention

The retention models presented indicate that women will remain in engineering if they are experiencing a significant level of psychological and physical involvement (Astin, 1985), are integrated in various communities (Tinto, 1975, 1987), and receive adequate support and have opportunities for long-term community involvement (Sedlacek, 1993). These models, along with the women's developmental theories (Gilligan, 1982; Jordan et al., 1991) emphasize the important role that connection, community and relationships play in the retention of women. The focus group model can be used as a means of increasing the level of student involvement and integration.

The Focus Group Evaluation: Student Voices

In order to assess the impact and significance of the focus group on the female engineering students, the Women in Engineering Research Fellows were asked whether they believed the focus groups were a valuable experience. All (100%) responded that they were valuable. One fellow explained, "It gave me a chance to meet other fellows so I didn't feel as isolated in my experience." Another student commented, "It encouraged me to continue on with my research."

Overall, being able to give feedback regarding their experience as a research fellow and as a woman in engineering was very important. Meeting the other women, talking about experiences, sharing the same stress and challenges, being able to hear what other females feel through expressing their own opinions in a supportive atmosphere, were all comments given to show their appreciation for the focus group process. Hearing other's problems and challenges helped them in solving their own dilemmas with less frustration. The women commented on

how rewarding it was to see that through the focus group discussions, they were able to express their opinions and then eventually see changes in the program.

Focus Groups As a Means of Increasing Student Involvement

As illustrated above the focus group process taps into the essence of student experiences. Within each of the students' stories there is a rich array of thoughts, perceptions, and feelings that can serve as valuable insights into how the program can be enhanced. By listening to women students, their voices can be woven into the foundations of the program; their recommendations and suggestions can be used to make changes or additions to the existing program. Not only does this process help to tailor the program to fit the specific needs of the students, it also allows the students to become actively engaged in the development of the program. Whether the students' suggestions are feasible for implementation or not, the basic act of listening communicates to them that their ideas and participation is important. Ultimately, this process plays a powerful role in inviting students to become involved in the culture of engineering. For example, in one of the Research Fellows focus groups, after exploring some of the ways the program could be changed, one student stated that she felt like a "mother" of the Research Fellows Program. Her metaphor eludes to the fact that she has taken part in the creation and development of the program. She has become part of the generation of women shaping the world of engineering for the next.

Focus Groups As a Means of Community

Implementing a series of focus groups for program evaluation serves as an important link to increasing the retention of women students in engineering. Students begin to feel a sense of belonging to the program, their department, and ultimately, to the world of engineering. For the Research Fellows, the focus group was a forum for women from various disciplines to meet and to exchange thoughts and ideas about their experiences of conducting research. From this discussion, students were able to provide suggestions for one another on how to communicate with professors, find resources for assistance, and manage the multiple roles of school and research. In addition, students had an opportunity to meet other women and develop a sense of community. Connecting with each other and sharing experiences builds support and a sense of belonging within the traditional engineering environment. Feelings of belonging will encourage the female engineering student to persist in a field that has not always felt welcoming. The focus group process provided information to continue to develop and shape programs and services for female engineers. The focus groups themselves, contributed to building community amongst the women, thus serving as a link to increased retention.

References

Astin, A. (1985). Achieving educational excellence: A critical assessment of priorities and practices in higher education. San Francisco: Jossey-Bass.

Barber, L.A. (1995). U.S. women in science and engineering. 1960-1990. Journal of Higher Education, 66 (2), 213-234.

Bers, T. H. (1989). The popularity and problems of focus group research. College and University, 64 (3), 260-268.

Cook, E.P. (1993). Women, relationships, and power: Implications for counseling. Alexandria, VA: American Counseling Association.

Gilligan, C. (1982). In a different voice. Cambridge, MA: Harvard University Press.

Hall, R., and Sandler, B (1982). The classroom climate: A chilly one for women? Report of the project on the status of education of women. Washington, D.C.: Association of American Colleges.

Hotelling, K., and Forrest, L. (1985). Gilligan's theory of sex-role development: A perspective for counseling. Journal of Counseling and Development, 64, 183-186.

Jordan, J.V., Kaplan, A.G., Miller, J.B., Stiver, I.P., Surrey, J.L.(1991). Women's growth in connection. New York: The Guildord Press.

Kaase, K.J., and Harshberger, B. (1993). Applying focus groups in student affairs assessment. NASPA Journal, 30 (4), 284-289.

Michel, J. (1988). Women in engineering education. Paris, France: Unesco.

Miller, J. B. (1986). What do we mean by relationships? (Work in progress No. 22). Wellesley, MA: Stone Center for Development Services and Studies.

Pascarella, E.T., and Terenzini, P.T., (1991). How college effects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.

Sedlacek, W.E. (1991). Using noncognitive variables in advising nontraditional students. National Academic Advisor's Association Journal, 11 (1), 75-82.

Sedlacek, W.E. (1993). Employing noncognitive variables in the admissions and retention of nontraditional students. In Achieving diversity: Issues in the recruitment and retention of traditionally underrepresented students. National Association of College Admission Counselors, Alexandria, VA.

Tinto, V. (1987). Leaving college: Rethinking the causes and cures of student attrition. Chicago: University of Chicago Press.

Wellesley College Center for Research on Women. How schools shortchange girls. The AAUW Report. Washington, D.C.: AAUW Educational Foundation, 1993.